

$$e/m$$

Name: _____ Section: 4BL-____ Date performed: ____/____/____

Lab station: _____ Partners: _____

Part I

Measurements:

I (A)	V (V) (range)	h_{bot} (cm)	h_{top} (cm)
	()		
	()		
	()		
	()		
	()		

Analysis:

$$B = (\text{_____ mT/A})I$$

R (m)	B (mT)	V (kV)	$B^2/(2V)$ (mT ² /kV)	$1/R^2$ (m ⁻²)

Attach $B^2/(2V)$ vs. $1/R^2$ graph from Excel.

$$\text{Experimental } e/m = (\text{_____} \pm \text{_____}) \text{ kV}/(\text{mT}^2 \text{ m}^2)$$

$$= (\text{_____} \pm \text{_____}) \times 10 \text{ C/kg}$$

$$\text{Accepted } e/m = \text{_____} \times 10 \text{ C/kg}$$

Comparison:

Part II

(A) Draw a picture of the apparatus and show (1) the deflected electron beam, (2) the direction of the magnetic field, and (3) the direction of current flow through the Helmholtz coils. Explain how you got the directions for (2) and (3).

(B) Describe the path of the beam and explain why.

(C) Illustrate where you placed the magnet to get the downward deflection of the beam. What is the direction of the magnetic field in the region of the beam?